St. Augustine, Fla., 13th, 11:55 p. m., two almost imperceptble tremblings were experienced, lasting about two seconds, with the same intervals of rest; these were followed by a rapid vibratory motion, apparently from east to west, lasting two or three seconds; in the small and weaker houses of the town small objects were thrown from shelves by the shock; plaster was detached from the walls of houses in several places; the sentry on post reports hearing at the time a heavy explosion as of a distant torpedo at sea.

Sunsets.—The characteristics of the sky at sunset, as indications of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Corps Stations. Reports from 117 stations show 3,597 observations to have been made, of which 39 were reported doubtful; of the remainder 2,921, or 81.2 per cent. were followed by the expected weather.

Sun Spots.—The following monthly record of observations by Mr. D. P. Todd, Nautical Almanac office, Washington, D. C., is communicated by Prof. S. Newcomb, U. S. Navy, in charge of that office:

JANUARY 1879.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		Remarks.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
2nd, 2 p. m...	1	2	0	0	0	0	1	2	
" 3 p. m...	0	0	0	0	0	0	1	2	
4th, 3 p. m...	0	0	1	2	0	0	0	0	Small group of faculæ.
7th, 2 p. m...	0	0	0	0	0	0	0	0	
13th, 3 p. m...	0	0	0	0	0	0	0	0	
14th, 3 p. m...	0	0	0	0	0	0	0	0	
16th, 2 p. m...	0	0	0	0	0	0	0	0	
18th, 2 p. m...	0	0	0	0	0	0	0	0	
20th, 2 p. m...	0	0	0	0	0	0	0	0	
21th, 3 p. m...	0	0	0	0	0	0	0	0	
23rd, 4 p. m...	0	0	0	0	0	0	0	0	
25th, 2 p. m...	0	0	0	0	0	0	0	0	
27th, 2 p. m...	0	0	0	0	0	0	0	0	
29th, 3 p. m...	0	0	0	0	0	0	0	0	

Mr. Jay Harcourt, at Wappinger's Falls, N. Y., examined the sun on the following days, but observed no spots: 6th, 7th, 12th, 14th, 18th to 20th, 22nd, 25th, 26th, 29th, 30th, 31st. Mr. David Trowbridge, at Waterburg, N. Y., examined the sun on the following days, but observed no spots: 1st, 11th to 13th, 17th, 22nd, 24th to 26th, 28th to 31st. Mr. William Dawson, at Spiceland, Ind., examined the sun on the following days, but observed no spots: 18th, 21st, 26th, 28th, on the 30th one group was seen with two spots. Prof. G. Hinrichs at Iowa City, Ia., examined the sun on twenty days, no spots seen. Observations were also continued daily at Fort Whipple, Va., but no spots observed.

NOTES AND EXTRACTS.

Atmospheric Electricity.—In *Nature* for January 2d is given a report on the observations of atmospheric electricity made seven times a day at Montsouris. It is stated that during a recent long continuance of high pressure, and with a variety of cold and unpleasant weathers, the indications were invariably of positive electricity; that the change to negative electricity took place simultaneously with the change to warmer, thawing weather. At page 220, January 9th, it states that the electric indications at Kew were the same as at Montsouris.

Clouds and Weather.—The following extracts are from a lecture by W. C. Ley, on clouds and weather-signs, (*Nature*, 1878, page 178):

"As regards configuration, clouds seem naturally divisible into two groups, those which arrange themselves in layers, whose vertical diameter is small as compared with its horizontal, and those which assume spherical or hemispherical shapes; and this division is related to certain physical conditions of the atmosphere and of the earth's surface beneath the cloud. It is, however, essential that we should possess some name or system of names to distinguish those clouds which are conveyed by the upper currents, and the term cirrus, with its compounds, must be more closely restricted to this class of clouds than has yet been done. From the use of weather-maps a new science of the winds has originated, on which all attempts at weather forecasting must be based. The movements of the upper clouds afford most valuable information concerning the distribution and movement of the areas of high and low barometric pressure. Rules by which this information may be interpreted, based in great measure on a former investigation by the lecturer,[1] are somewhat complex, and cannot well be given in a brief *résumé* like the present.[2] It may be sufficient to explain that in the front of an advancing barometric depression there usually extends a bank of the halo-producing cirro-stratus, the exterior edge of which is, roughly speaking, a parabola, the focus of which lies in the line about to be traversed by the centre of the depression. On the right-hand of the centre this bank or sheet is abruptly broken and is succeeded in the rear by local shower-clouds. On the left-hand the sky commonly continues overcast, but the cloud-plane gradually descends until little is to be seen but low stratus. A backing of the upper current takes place until after the centre of the depression has passed. In whatever direction a depression is advancing the same characteristic phenomena are observed. Thus changes in the clouds indicate to us probable alterations of wind and weather."

"While the nimbus, which exists in the front of a depression, first makes its approach evident by changes in the higher cloud-strata, the process of nubification is the converse of this in those local showers which commonly occur on the right-hand and in the rear of a centre of depression, and therefore when the baro-

meter is rising or just about to rise. These latter are developed in an upward direction through the formation of cumulus. The precipitation which occurs in them—always preceded by a change of appearance in the domes of cloud, which assume a soft and cirriform aspect—is attributed to the neutralization of electricities as the summit of the cloud passes into a higher region; but there are important differences of appearance between those cumuli which are likely, and those which are unlikely, to undergo this transformation."

1 "Relation between the Upper and Under Currents of the Atmosphere around Areas of Barometric Depression." *Quart. Journ.* of Met. Soc. vol. iii. p. 437. 2 The lectures will shortly be published.

Scintillation of Stars.—From observations for many years on the scintillation of the stars, Montigny derives the following conclusions, (*Nature*, page 233):

"M. Montigny tried to solve the question whether the changes of colour in scintillation follow certain definite laws; whether, for instance, their relative frequency expressed in numbers, shows differences which depend on the nature of the star's own light, on the star's elevation above the horizon, or on the condition of the atmosphere."

"The way in which the observations were made was the following:—For each evening of observation, not only the values for the intensity of scintillation were entered for each star, reduced to a distance of 60° from the zenith, but each single color observed in the circular image was also noted down. Further the observations made in wet weather were noted separately from those made during dry weather. Finally the various colors were entered on a table divided into seven columns, respectively headed—red, orange, yellow, green, blue-green, blue, and violet. The sum total of any column thus indicates the number of times which the color in question was observed in a certain star. Arcturus, for instance, in 131 observations during moist weather, showed the red color 130 times and blue 118 times. These numbers thus express the absolute frequency of these two colors. If we compare the number of 130 for red, with the sum total of all colors shown by Arcturus during rainy weather, which is 491, then we obtain the relative frequency of red, which is 0.265, or multiplied by 1000 = 265. Therefore in 1000 changes of color which appeared in Arcturus during rainy weather, red occurred 265 times, and blue 240 times."

"The observations show, (1) the relative frequency of red is far greater than that of any other color in rainy weather as well as in dry; (2) red, green, and particularly orange, are seen more frequently in dry weather than in wet; (3) the frequency of yellow and blue is on the contrary greater in wet weather than in dry."

"Although the differences in the frequency of one and the same color, according to the state of the atmosphere, are rather limited, they nevertheless indicate an important fact. It is also remarkable that the numeric differences in the complementary colors red and green on the one hand, and blue and yellow on the other, lie in the same direction. It is further worthy of notice that the greater frequency of blue in rainy weather agrees well with the fact that the blue greatly predominates during such weather in the image of the star as shown by the scintillometer. This predominance of blue has also been frequently observed a short time previous to rainy weather."

"For the sake of comparison M. Montigny has calculated the relative frequency of colors in two stars of the second type. The stars selected were Pollux, with a very characteristic spectrum, and Capella, which scintillates with great regularity. Both stars are yellow and their spectra show very thin dark lines. The influence of the weather was equally apparent in these stars; in dry weather red was more frequent, and in rainy weather blue."

Direction of motion of Cyclones.—Mr. Eliot, meteorological reporter for the province of Bengal, announces that a cyclonic vortex, when generated in the midde of the Bay of Bengal, always travels towards that part of the coast where the wind velocity for the time being is least in comparison with the average velocity for the same place and time of year. This law has been verified by almost all the cyclonic disturbances that have occurred in the Bay since a chain of meteorological observatories was established round it, and it lends a great deal of support to the theory that a cyclonic vortex is developed through the accumulation, concentration, and condensation of aqueous vapour over a region of comparative calm.

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Albert J. Myer

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